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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/657,738	09/08/2000	Junji Otani	NV/P-22090/A	3187

324 7590 02/22/2002

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PATENT DEPARTMENT
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EXAMINER

YAMNITZKY, MARIE ROSE

ART UNIT	PAPER NUMBER
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1774

DATE MAILED: 02/22/2002

4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/657,738

Applicant(s)
Junji OTANI et al.

Examiner
M. Yamnitzky

Art Unit
1774



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three (3) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09/08/00 and 12/07/00.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 2 20) ☐ Other:

Art Unit: 1774

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. The abstract of the disclosure is objected to because it is too long. Correction is required.

See MPEP § 608.01(b). The examiner suggests ending the abstract after formula I and III.

3. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by

Art Unit: 1774

raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claims 1 and 7 recite the broad recitation "aryl radicals" with respect to Ar_1 and Ar_2 , and the claims also set forth formulae of aryl radicals which is the narrower statement of the range/limitation. Claims 1 and 7 recite the broad recitation " R_8 and R_9 together stand for" one of four possibilities, and the claims also recite "preferably $-CH_2-CH_2-O-CH_2-CH_2-$ " which is the narrower statement of the range/limitation. Claim 3 recites the broad recitation "nucleophilic agent" and also recites "a secondary amine..." which is the narrower statement of the limitation. Claim 6 recites the broad recitation "polystyrene" and also recites "high impact polystyrene" which is the narrower statement of the limitation.

The definition of R_1 and R_2 as set forth in claims 1 and 7 is unclear. It is not clear if Ar_3 is a possible substitution for the allyl, or if Ar_3 is a possibility for R_1 and R_2 by itself. It is not clear if $-CR_3R_4-(CH_2)_m-Ar_3$ is a possible substitution for the allyl, or if $-CR_3R_4-(CH_2)_m-Ar_3$ is a possibility for R_1 and R_2 by itself. It is not clear if "phenyl which can be substituted one to three times with C_1-C_3 alkyl" is a possibility for R_3 and R_4 or a possibility for R_1 and R_2 by itself.

The definition of Ar_3 as set forth in claims 1 and 7 is unclear. It is not clear if "phenyl, which can be substituted with C_1-C_8 alkyl or C_1-C_8 alkoxy one to three times" is a duplicative

Art Unit: 1774

recitation or if this phenyl is a possible substituent for the "phenyl or 1- or 2-naphthyl which can be substituted one to three times".

The definition of Ar_1 and Ar_2 as set forth in claims 1 and 7 is unclear because, as noted above, it is not clear if Ar_1 and Ar_2 may be any aryl radical, or if they are limited to the preferred radicals set forth in these claims. It is also not clear if "julodidyl" is intended to be of a different scope than the formula set forth immediately after "julodidyl"; if not, either "julodidyl" or the formula should be deleted since recitation of both is duplicative. It is also not clear if the "which can be substituted" phrase which appears after the julodidyl formula pertains only to the julodidyl formula.

The definition of R_{10} as set forth in claims 1 and 7 is unclear. It is not clear if R_{10} is limited to C_6 - C_{24} -aryl, or if R_{10} may also be a "saturated or unsaturated heterocyclic radical..."; see the nineteenth through fifteenth lines from the end of claim 1 and the corresponding text in claim 7. (The distinction is relevant with respect to R_{10} as part of $-OR_{10}$ and $-C(O)R_{10}$).

The fourteenth line from the end of claim 1 and the corresponding text in claim 7 defines " R_{11} " but there is no R_{11} elsewhere in these claims.

It is not clear what is being defined in the tenth through seventh lines from the end of claim 1 and the corresponding text in claim 7. It is not clear if these lines pertain to R_{12} , R_{13} and R_{14} , or if these lines pertain to R_5 , R_6 and R_7 , or if these lines pertain to something other than these R groups.

Art Unit: 1774

Claims 2-5, with claim 6 dependent from claim 5, are not proper dependent claims as dependent from claim 1 because they incorporate only a portion of the subject matter of claim 1 (claim 1 being drawn to an electroluminescent device comprising a DPP of formula I or III and claims 2-6 incorporating by reference to claim 1 only the DPP compound of formula I or III).

Claim 3 is also not a proper dependent claim because it makes reference to two different claims (claim 1 is referenced in line 1, and claim 2 is referenced in the line beginning “(b) then treating”) and does not depend from these multiple claims in the alternative.

The first two lines of claims 2 and 3 are grammatically unclear in reciting “in treating”.

The second line after formulae Va and Vb in claim 2 and the third line of step (b) in claim 3 are grammatically unclear in reciting “an usual alkylating agent”.

It is not clear if “the alkylating agent” which is defined in the last four lines of each of claims 2 and 3 is the same as the “an usual alkylating agent” set forth earlier in claims 2 and 3. The definition of the alkylating agent is also unclear because the terminology “sulfonate...halogen” does not correspond one-for-one with the definition of X as set forth in these claims (e.g. a “tosylate” has one more oxygen than the second possibility for X and the third possibility for X does not provide any of the agents in the phrase “sulfonate...halogen”). The possibilities for “X” are also confusing because it is not clear how these possibilities could provide an alkylating agent of the specified formulae having two R_1 or two R_2 . The definition of the alkylating agent is also unclear because, in the case of claim 2, it is not clear if R_1 and R_2 have the same definition as in claim 1. Noting that R_1 and R_2 as defined in claim 1 encompass groups that are not alkyl groups

Art Unit: 1774

whereas R_1 and R_2 as set forth in claim 2 and in step (b) of claim 3 are part of an "alkylating" agent, it is not clear if R_1 and R_2 as set forth in claim 2 and in step (b) of claim 3 are limited to the specific alkyl groups allowed by claim 1 (i.e. alkyl groups having 1-25 carbon atoms).

In the second and third lines after formulae VIa and VIb in claim 3, it is not clear if "an alcohol... $R_8(O)_n\text{Se-Se}(O)_nR_8$ " are possibilities for the nucleophilic agent, or treating agents separate from the nucleophilic agent. If these are possibilities for the nucleophilic agent, the examiner suggests deleting "or" before " $\text{HS}(O)_nR_8$ " in the second line after formulae VIa and VIb and inserting --or-- before $R_8(O)_n\text{Se-Se}(O)_nR_8$.

In claim 3, it is not clear if the molar ratio of DPP VIa or VIb:nucleophilic agent is limited to the preferred ratios, or if any ratio is within the scope of the claimed process.

Because of the use of the terms "usually" and "generally", it is not clear if the amount of anhydrous base used for the process of claim 3 must be in the range of 0.1 to 15 moles per mole of nucleophilic agent, if the temperature at which the treatment is carried out must be in the range of 100 to 220 °C, and if the pressure at which the treatment is carried out must be in the range of 100 to 300 kPa. It is not clear if amounts, temperatures and pressures other than those indicated as "usually" or "generally" are within the scope of the claimed process.

It is not clear if R_8 , R_9 and R_{10} as set forth in claim 3 are the same as defined in claim 1.

Since step (a) of claim 3 states that R_1 and R_2 are as defined as in claim 1 (which does not allow either to be hydrogen), it is not clear how compound Va or Vb can be obtained by step (a).

Art Unit: 1774

Since step (a) of claim 3 states that R_1 and R_2 are as defined as in claim 1, it is not clear why step (b) is necessary and/or how step (b) can be carried out on the product of step (a).

The metes and bounds of the method of claim 4 are not clear because of the recitation "in analogy to known methods in the art."

In using the plural terms "materials" and "compounds", it is not clear if multiple organic materials must be colored according to the method of claim 4 and if plural compounds must be used in the method of claim 4, or if coloring of a single organic material with a single compound of formula I or III is within the scope of claim 4.

There is no antecedent basis for "the colored high molecular weight organic material" as recited in lines 2-4 of claim 5.

The term "high", which is recited in claims 5 and 6 in the phrases "high molecular weight organic material", "high molecular organic material" and "high impact polystyrene", is relative. Insufficient guidance is provided in the specification to determine the metes and bounds of the phrases incorporating this relative term.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 1774

5. Claims 2, 4, 5 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Jost et al. (4,585,878).

See the whole patent. In particular, see column 6, line 66 - c. 15, l. 12, c. 15, l. 42 - c. 17, l. 55 and c. 21, l. 51 - c. 24, l. 45.

The fluorescent diketopyrrolopyrroles of present claim 7 are anticipated by Jost et al. because Jost et al. disclose various species within the scope of present formula I. As taught at c. 9, l. 30, Jost's compounds are fluorescent (also see c. 11, l. 61-64). If Ar_1 and Ar_2 must be one of the preferred aryl radicals set forth in claim 7, then the diketopyrrolopyrrole (DPP) compounds of formulae (X), (XI), (XII), (XIII), (XIV), (XIX) and the DPP compounds made according to Examples 16-18 are species within the scope of claim 7. Each of these compounds corresponds to a compound of formula I wherein each of Ar_1 and Ar_2 has the first formula shown for the preferred aryl radicals wherein R_5 stands for hydrogen, one of R_6 and R_7 stands for hydrogen, and the other of R_6 and R_7 stands for cyano, halogen or C_1 -alkyl, thus meeting claim 7's proviso that R_6 and R_7 do not stand simultaneously for hydrogen (this proviso applying only if the Ar_1 and Ar_2 are limited to the preferred aryl radicals). If Ar_1 and Ar_2 may be any aryl radical, then the prior art DPP compounds of formulae (IX) as shown for Example 1a, (XVI), (XVII), (IX) as shown for Example 12, and the DPP compounds made according to Examples 11 and 15 are also species within the scope of claim 7.

Note that with respect to the preferred aryl radicals for the DPP compounds made according to the process of present claim 2, used according to the method of present claim 4, and

Art Unit: 1774

required by the composition of present claim 5, there is no proviso that R_6 and R_7 do not stand simultaneously for hydrogen.

At least prior art examples 11 and 18 provide DPP compounds made by the process of present claim 2. (The process used to make the compounds according to prior art examples 4 and 15-17 may also meet the limitations of present claim 2, subject to clarification of the metes and bounds of the "alkylating agent" required by claim 2.)

Jost et al. disclose coloring polymeric materials by incorporating a DPP compound thus anticipating the method of claim 4 and the composition of claim 5. For example, see c. 6, l. 66 - c. 9, l. 17 for example.

6. Claims 1 and 4-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsumura et al. (EP 0 499 011 A1).

See the entire reference. In particular, see page 5, line 43 through p. 7, l. 11, p. 8, l. 40-56, p. 11, l. 5-15 and Example 7 on p. 15 with reference to Example 1 on pp. 12-13.

Example 7 provides an electroluminescent device which comprises, in the order listed, an anode, a hole transporting layer, a light-emitting layer and a cathode. The light-emitting layer comprises a diketopyrrolopyrrole within the scope of formula I as defined in present claim 1 regardless of whether Ar_1 and Ar_2 may be any aryl radical, or Ar_1 and Ar_2 are limited to the preferred aryl radicals.

Art Unit: 1774

The diketopyrrolopyrrole of prior art Example 7 is within the scope of formula I as defined in present claim 7 if Ar_1 and Ar_2 may be any aryl radical. If Ar_1 and Ar_2 of claim 7 are limited to the preferred aryl radicals, in which case the proviso set forth in the last two lines of claim 7 applies, then the diketopyrrolopyrrole of prior art Example 7 does not meet the limitations of claim 7. However, fluorescent diketopyrrolopyrroles meeting the preferred definition with the proviso set forth in claim 7 could at once be envisaged by one of ordinary skill in the art at the time of the invention given the prior art's teachings of most preferred compounds (p. 6, l. 46-47). Also see claim 10 of the reference. Prior art claim 10, as dependent from claim 9, limits the compound of formula I to three specific possibilities, one of which meets the preferred definition with the proviso set forth in present claim 7.

With respect to the subject matter of present claims 4-6, see p. 8, l. 40-56.

7. Claim 7 is rejected under 35 U.S.C. 102(b) as being anticipated by DE 37 13 459 A1.

The prior art discloses fluorescent diketopyrrolopyrroles within the scope of formula I. The compounds of formula (2b), (2c) and (2d) as shown on page 3 of the prior art meet the limitations of formula I as defined in claim 7 including the proviso set forth in the last two lines of the claim. The compound of formula (2a) as shown on page 3 of the prior art also meets the limitations of formula I as defined in claim 7 if Ar_1 and Ar_2 may be any aryl radical (the proviso applying only to the preferred aryl radicals).

Art Unit: 1774

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jost et al.

(4,585,878) as applied to claims 2, 4, 5 and 7 above, and for the further reasons set forth below.

Jost et al. disclose coloring polymeric materials such as polyamide, polystyrene, methacrylates and ABS, but do not explicitly disclose coloring these materials so as to provide a composition having amounts of DPP compound and polymeric material required by claim 6 (by virtue of claim 6's dependence from claim 5). Jost et al. do explicitly teach using amounts of DPP and polymeric material within the ranges set forth in claim 5 but only explicitly teach the amounts with respect to the coloring of polyester.

It would have been within the level of ordinary skill of a worker in the art at the time of the invention, as a matter of routine experimentation, to determine suitable and optimum amounts of DPP colorant and polyamide, polystyrene, polymethylmethacrylate or ABS to be combined. One of ordinary skill in the art would have been motivated to combine amounts of DPP colorant and polymeric material suitable to provide the colored polymeric material with the desired depth of shade while avoiding excess amounts of colorant that would increase cost without providing additional colorant benefits.

Art Unit: 1774

10. Claims 1, 2 and 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumura et al. (EP 0 499 011 A1) and Jost et al. (4,585,878) in combination.

The Matsumura reference is directed to an electroluminescent device comprising a diketopyrrolopyrrole compound in the light-emitting layer of the device. Matsumura et al. teach that the compounds may be made by the methods described in the patent to Jost et al. For example, see page 5, line 43 through p. 7, l. 11, p. 8, l. 40-56, p. 11, l. 5-15 and Example 7 on p. 15 with reference to Example 1 on pp. 12-13 in the Matsumura reference. See column 6, line 66 - c. 15, l. 12, c. 15, l. 42 - c. 17, l. 55 and c. 21, l. 51 - c. 24, l. 45 in the Jost patent.

Matsumura et al. and Jost et al. both disclose specific diketopyrrolopyrrole compounds within the scope of the present claims, but neither reference discloses examples encompassing the entire scope of compounds encompassed by the present claims. It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to make compounds similar in structure to those disclosed in the prior art references. One of ordinary skill in the art would have been motivated to make compounds similar in structure to those disclosed by Matsumura et al. and Jost et al. with the expectation that compounds similar in structure would have similar properties and could be used for the purposes taught by Matsumura et al. and Jost et al.

11. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (703) 308-4413. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

Art Unit: 1774

The current fax numbers for Art Unit 1774 are (703) 872-9311 for official after final faxes and (703) 872-9310 or (703) 305-5408 for all other official faxes. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (703) 872-9041.)

MRY
02/20/02

Marie R. Yamnitzky

MARIE YAMNITZKY
PRIMARY EXAMINER

1774